In the Claims

1. (Currently Amended) A system comprising:

an interface coupled to a bus to receive a real time video stream;

a main processor coupled to the bus, the main processor to process a first group of video encoding tasks comprising those video encoding tasks not including variable length encoding involved with encoding the real time video stream;

a co-processor coupled to the bus, the co-processor to process a second group of view encoded tasks including a variable length encoding tasks involved with encoding the real time video stream, wherein the processing of the first group of video encoding tasks is executed concurrently with the processing of the second group of video encoding tasks.

2. (Original) The system of claim 1 wherein the first group of video encoding tasks and the second group of video encoding tasks comprise those tasks required of at least one of the Moving Pictures Expert Group (MPEG) standards for video encoding.

3. (Original) The system of claim 1 wherein:

the first group of video encoding tasks comprises at least motion estimation, pre-processing, mode selection, forward discrete cosine transform computation, forward quantization computation, rate control, zig zag scanning, inverse discrete cosine transform computation, inverse quantization computation, and motion compensation; and

the second group of video encoding tasks comprises variable length encoding computation.

4. (Original) The system of claim 3 wherein the variable length encoding computation comprises:

macroblock header encoding;

motion vector encoding; and

discrete cosine transform coefficients encoding.

5. (Original) The system of claim 3 wherein the motion estimation comprises:

a first phase includes top to top searching and bottom to bottom searching; and

a second phase includes top to bottom searching and bottom to top searching.

6. (Original) The system of claim 3 wherein the pre-processor is a variable length encoder/decoder co-processor.

7. (Original) The system of claim 1 wherein the co-processor is a variable length encoder/decoder co-processor.

8. (Original) The system of claim 1 wherein the interface is at least one of a broadcast interface and a network interface.

9. (Original) The system of claim 1 further comprising:

an audio output interface; and

a video output interface.

10. (Original) The system of claim 1 wherein the real time video stream is at least on of a television signal received wirelessly and a television stream received via a hardwired connection.

11. (Canceled)

12. (Currently Amended) ~~The~~ A system ~~of claim 11 wherein~~ comprising:

a main processor coupled to a bus;

a co-processor coupled to the bus;

a main memory coupled to the bus;

an interface coupled to the bus to receive a real time video stream; and

a video encoding process executed from the main memory by the main processor to cause the main processor to allocate a ~~the~~ first group of video encoding tasks

comprising ~~comprises~~ those video encoding tasks not including variable length encoding involved with encoding the real time video stream according to a ~~the~~ well known standard to the main processor and allocate to the co-processor a ~~the~~ second group of video encoding tasks comprising ~~comprises~~ variable length encoding tasks involved with encoding the real time video stream according to ~~a~~ the well known standard, wherein the main processor processes the first group of video encoding tasks concurrently with the co-processor processing the second group of video tasks.

13. (Original) The system of claim 12 wherein the well known standard is at least one of the Moving Pictures Expert Group (MPEG) standards for video encoding.

14. (Currently Amended) The system of claim [[11]] 12 wherein the encoding tasks comprises at least motion estimation, pre-processing, mode selection, forward discrete cosine transform computation, forward quantization computation, rate control, zig zag scanning, inverse discrete cosine transform computation, inverse quantization, and motion compensation; and

the second group of video encoding tasks comprises variable length encoding computation.

15. (Original) The system of claim 14 wherein the variable length encoding computation comprises:

macroblock header encoding;

motion vector encoding; and

discrete cosine transform coefficients encoding.

16. (Original) The system of claim 14 wherein the motion estimation comprises:

a first phase includes top to top searching and bottom to bottom searching; and

a second phase includes top to bottom searching and bottom to top searching.

17. (Original) The system of claim 14 wherein the pre-processing comprises:

noise reduction.

18. (Currently Amended) The system of claim [[11]] 12 wherein the co-processor is a variable length encoder/decoder co-processor.

19. (Currently Amended) The system of claim [[11]] 12 wherein the interface is at least one of a broadcast interface and a network interface.

20. (Currently Amended) The system of claim [[11]] 12 further comprising:

an audio output interface; and

a video output interface.

21. (Currently Amended) The system of claim [[11]] 12 wherein the real time video stream is at least one of a television signal received wirelessly and a television stream received via a hardwired connection.

22. (Canceled)

23. (Currently Amended) The method of claim [[22]] 28 wherein the video encoding is performed according to at least one of the Moving Pictures Expert Group (MPEG) standards for video encoding.

24. (Currently Amended) The method of claim [[22]] 28 wherein:

the first group of video encoding tasks comprises at least motion estimation, pre-processing, mode selection, forward discrete cosine transform computation, forward quantization computation, rate control, zig zaq scanning, inverse discrete cosine transform computation, inverse quantization computation, and motion compensation; and

the second group of video encoding tasks comprises variable length encoding computation.

25. (Original) The method of claim 24 wherein the variable length encoding computation comprises:

macroblock header encoding;

motion vector encoding; and

discrete cosine transform coefficients encoding.

26. (Original) The method of claim 24 wherein the motion estimation comprises:

a first phase that includes top to top searching and bottom to bottom searching; and

a second phase that includes top to bottom searching and bottom to top searching.

27. (Original) The method of claim 24 wherein the pre-processing comprises:

noise reduction.

28. (Currently Amended) ~~The~~ A method ~~of claim 22 wherein~~ for video encoding comprising:

receiving a real time video stream;

performing picture level and upper processing on a main processor;

executing a macroblock loop in parallel on the main processor and a co-processor, wherein executing includes processing on the main processor a ~~the~~ first group of video encoding tasks comprising ~~comprises~~ those video encoding tasks not included in the variable length encoding involved with encoding the real time video stream according to the well known standard concurrently with the processing on the co-processor a ~~the~~ second group of video encoding tasks comprising ~~comprises~~ variable length encoding tasks involved with encoding the real time video stream according to a well known standard; and

outputting an encoded version of the real time video stream.

29. (Currently Amended) The method of claim [[22]] 28 wherein the co-processor is a variable length encoded/decoder co-processor.

30. (Currently Amended) The method of claim [[22]] 28 wherein the real time video stream is at least one of a television signal received wirelessly and a television stream received via a hardwired connection.

31. (Canceled)

32. (Currently Amended) The method readable medium of claim [[31]] 37 wherein the first group of video encoding tasks and the second group of video encoding tasks comprise those tasks required of at least one of the Moving Pictures Expert Group (MPEG) standards for video encoding.

33. (Currently Amended) The machine readable medium of claim [[31]] 37 wherein:

the first group of video encoding tasks comprises at least motion estimation, pre-processing, mode selection, forward discrete cosine transform computation, forward quantization computation, rate control, zig zag scanning, inverse discrete cosine transform computation, inverse quantization computation, and motion compensation; and

the second group of video encoding tasks comprises variable length encoding computation.

34. (Original) The machine readable medium of claim 33 wherein the variable length encoding computation comprises:

macroblock header encoding;

motion vector encoding; and

discrete cosine transform coefficient encoding.

35. (Original) The machine readable medium of claim 33 wherein the motion estimation comprises:

a first phase that includes top to top searching and bottom to bottom searching; and

a second phase that includes top to bottom searching and bottom to top searching.

36. (Original) The machine readable medium of claim 33 wherein the pre-processing comprises:

noise reduction.

37. (Original) ~~The~~ A machine readable medium ~~of claim 31 wherein~~ having instructions stored thereon which when executed by a main processor cause the main processor perform operations to encode a real video stream, the operations comprising:

allocating a ~~the~~ first group of video encoding tasks comprising ~~comprises~~ those video tasks not included in the variable length ~~encoder/decoder co-processor~~ encoding to the main processor;

allocating a ~~the~~ second group of video encoding tasks comprising ~~comprises~~ variable length encoding tasks involved with encoding the real time video stream according to a well known standard to the co-processor; and

processing the first group of video encoding tasks by the main processor concurrently with the processing of the second group of video encoding tasks by the co-processor.

38. (Currently Amended) The machine readable medium of claim [[31]] 37 wherein the co-processor is a variable length encoded/decoder co-processor.

39. (Currently Amended) The machine readable medium of claim [[31]] 37 wherein the real time video stream is at least one of a television signal received wirelessly and a television stream received via a hardwired connection.